

FLIGHT SUMMARY REPORT

Flight Number: 97-009-03
Calendar/Julian Date: 20 September 1997 • 263
Sensor Package: Thermal Infrared Multispectral Scanner (TIMS)
DoE Multispectral Scanner (MSS)
Area(s) Covered: Railroad Valley, Site 726
Death Valley, Site 731

Investigator(s): Palluconi and Hook, JPL

Aircraft #: 799
Department of Energy
Cessna Citation

SENSOR DATA

Accession #:	----	----
Sensor ID #:	086	1268
Sensor Type:	TIMS	MSS
Focal Length:	----	----
Film Type:	----	----
Filtration:	----	----
Spectral Band:	----	----
f Stop:	----	----
Shutter Speed:	----	----
# of Frames:	----	----
% Overlap:	----	----
Quality:	Good	Good
Remarks:		

Airborne Science and Applications Program

The Airborne Science Branch at NASA's Dryden Flight Research Center, Edwards, California, operates two ER-2 high altitude aircraft in support of NASA earth science research. The ER-2s are used as readily deployable high altitude sensor platforms to collect remote sensing and in situ data on earth resources, celestial phenomena, atmospheric dynamics, and oceanic processes. Additionally, these aircraft are used for electronic sensor research and development and satellite investigative support.

The ER-2s are flown from various deployment sites in support of scientific research sponsored by NASA and other federal, state, university, and industry investigators. Data are collected from deployment sites in Kansas, Texas, Virginia, Florida, and Alaska. Cooperative international scientific projects have deployed the aircraft to sites in Great Britain, Australia, Chile, and Norway.

Photographic and digital imaging sensors are flown aboard the ER-2s in support of research objectives defined by the sponsoring investigators. High resolution mapping cameras and digital multispectral imaging sensors are utilized in a variety of configurations in the ER-2s' four pressurized experiment compartments. The following provides a description of the digital multispectral sensor(s) and camera(s) used for data collection during this flight.

Department of Energy Remote Sensing Laboratory

The NASA Airborne Science and Applications Program at Ames Research Center contracted with the Department of Energy Remote Sensing Laboratory (RSL) in Las Vegas, Nevada to fly the RSL Multispectral Scanner (MSS) and the NASA Thermal Infrared Multispectral Scanner (TIMS) over the desert southwest. The scanners were flown on the DOE Cessna Citation.

The Cessna Citation is a low and medium altitude, moderate speed aircraft. It can operate from 4,000 to 35,000 feet above sea level at speeds between 135 and 225 knots. There are two instrument ports in the aircraft. The RSL 1268 Multispectral Scanner was mounted over the aft port and the NASA Thermal Infrared Multispectral Scanner was mounted over the forward port.

RSL Daedalus 1268 MSS

The DOE Multispectral Scanner simulates the spectral characteristics the Thematic Mapper (TM) multispectral scanners orbiting on Landsat 4 and Landsat 5. The seven TM bands are replicated with the MSS and four additional bands of discrete wavelengths are acquired. THE MSS acquires TM band six (thermal data) as two bands in low and high gain settings. The scanner is configured as follows:

<u>Daedalus Channel</u>	<u>TM Band</u>	<u>Wavelength, mm</u>
1	A	0.42 - 0.45
2	1	0.45 - 0.52
3	2	0.52 - 0.60
4	B	0.60 - 0.62
5	3	0.63 - 0.69
6	C	0.69 - 0.75
7	4	0.75 - 0.90

8	D	0.91 - 1.05
9	5	1.55 - 1.75
10	7	2.08 - 2.35
11	6	8.5 - 12.5 low gain
12	6	8.5 - 12.5 high gain

Sensor/aircraft parameters are as follows:

IFOV:	2.5 mrad
Total Scan Angle:	86°
Pixels/Scan Line:	716
Scan Rate:	12.5/25/50/100 scans/second

Thermal Infrared Multispectral Scanner

The Thermal Infrared Multispectral Scanner (TIMS) is a multispectral scanning system using a dispersive grating and a six element mercury cadmium telluride detector array to produce six discrete channels in the 8.2 *mm* to 12.2 *mm* region.

<u>Channel</u>	<u>Wavelength, <i>mm</i></u>	<u>NET</u>
1	8.2 - 8.6	< 0.3° C
2	8.6 - 9.0	< 0.3° C
3	9.0 - 9.4	< 0.3° C
4	9.4 - 10.2	< 0.3° C
5	10.2 - 11.2	< 0.3° C
6	11.2 - 12.2	< 0.3° C

Sensor/aircraft parameters are as follows:

IFOV:	2.5 mrad
Ground Resolution:	163 feet (50 meters) at 65,000 feet
Total Scan Angle:	76.56°
Swath Width:	16.9 nmi (31.3 km) at 65,000 feet
Pixels/Scan Line:	638
Scan Rate:	7.3 (scans/second)
Ground Speed:	400 kts. (206 m/second)

Information on data tape format, logical record format, and scanner calibration data may be obtained from the Aircraft Data Facility, NASA-Ames Research Center, Mail Stop 240-6, Moffett Field, California 94035-1000 (Telephone: 650-604-6252).

TIMS FLIGHT DATA
FLIGHT NUMBER: 97-009-03

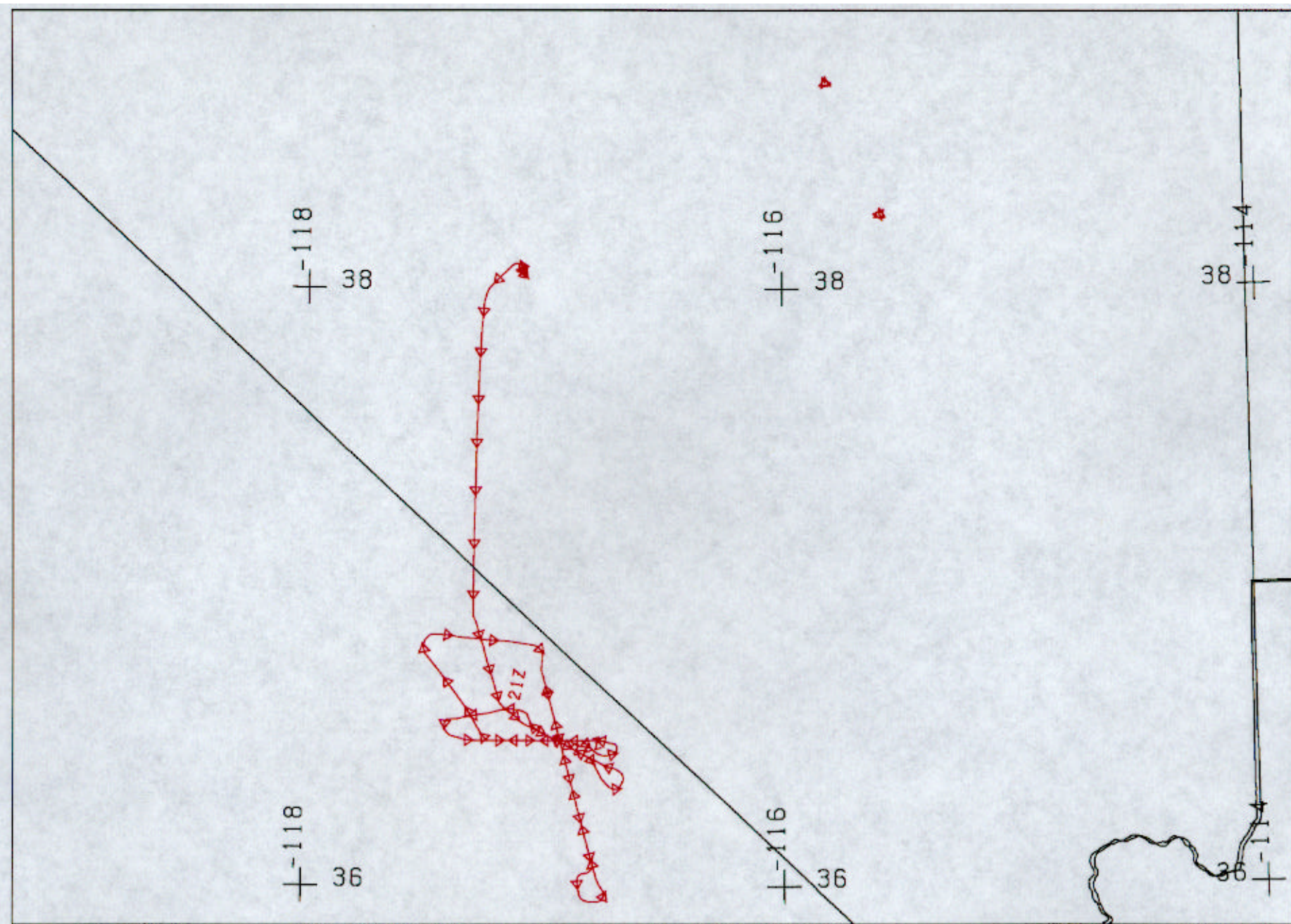
Site	Line	Run	A c t u a l t i m e (GMT) b e g i n e n d	A c t u a l scanline begin e n d	Altitude feet/meter	Scan Speed (rps)	total G o o d scanlines	total Interpolated scanlines	total Repeated scanlines	
1.	726	1	1	17:18:28.0 17:24:16.0	86079 94724	4800/ 1463	25.00	8646	0	0
2.	726	1	2	17:30:33.0 17:36:10.0	104122 112508	4800/ 1463	25.00	8387	0	0
3.	726	2	1	17:44:43.0 17:51:43.0	125268 135695	19800/ 6035	25.00	10428	0	0
4.	726	2	2	17:57:43.0 18:02:39.0	144663 152018	19800/ 6035	25.00	7354	0	2
5.	731	1	1	20:43:58.0 20:48:06.0	49680 55832	6000/ 1829	25.00	6153	0	0
6.	731	2	1	20:53:36.0 20:57:50.0	64041 70366	12000/ 3658	25.00	6326	0	0
7.	731	3	1	21:07:30.0 21:13:42.0	84797 94060	12000/ 3658	25.00	9264	0	0
8.	731	3	2	21:19:27.0 21:25:40.0	102625 111899	12000/ 3658	25.00	9275	0	0
9.	731	4	1	21:39:29.0 21:48:16.0	132530 145637	25000/ 7620	25.00	13108	0	0
10.	731	4	2	21:53:34.0 22:04:40.0	153560 170129	25000/ 7620	25.00	16570	0	0

Notes: Site 726 Railroad Valley
Site 731 Death Valley

DoE DAEDALUS TMS FLIGHT DATA
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Site	Line	Run	A c t u a l t i m e (GMT) b e g i n e n d	A c t u a l scanline begin e n d	Altitude feet/meter	Scan Speed (rps)	total G o o d scanlines	total Interpolated scanlines	total Repeated scanlines
1.	726	1	1	17:18:28.0 17:24:15.5	161599 178972	4800/ 1463 50.00	17374	0	0
2.	726	1	2	17:30:31.7 17:36:08.6	197786 214630	4800/ 1463 50.00	16845	0	0
3.	726	2	1	17:44:44.7 17:51:43.1	222106 227336	19800/ 6035 12.50	5231	0	0
4.	726	2	2	17:57:43.0 18:02:38.2	231844 235534	19800/ 6035 12.50	3691	0	0
5.	731	1	1	20:43:58.0 20:48:05.5	46207 52395	6000/ 1829 25.00	6189	0	0
6.	731	2	1	20:53:36.0 20:57:51.1	57769 60958	12000/ 3658 12.50	3190	0	0
7.	731	3	1	21:07:29.8 21:13:42.6	68192 72851	12000/ 3658 12.50	4660	0	0
8.	731	3	2	21:19:26.6 21:25:39.3	77151 81810	12000/ 3658 12.50	4660	0	0
9.	731	4	1	21:39:28.5 21:48:14.9	92175 98755	25000/ 7620 12.50	6581	0	0
10.	731	4	2	21:53:33.3 22:04:40.4	102735 111074	25000/ 7620 12.50	8340	0	0

Notes: Site 726 Railroad Valley
Site 731 Death Valley



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A/C 799

TIMS / DOE MSS 1268

